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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,526

12/08/2006

Richard Spitz

10191/4608

9368

26646 7590 11/10/2009  
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EXAMINER

HSIEH, HSIN YI

ART UNIT

PAPER NUMBER

2811

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11/10/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,526	<b>Applicant(s)</b> SPITZ ET AL.	
	<b>Examiner</b> Hsin-Yi (Steven) Hsieh	<b>Art Unit</b> 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 15-25 is/are pending in the application.
- 4a) Of the above claim(s) 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20060410, 20081126, 20090423</u> .                            | 6) <input type="checkbox"/> Other: _____                          |

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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group I of claims 15-24 in the reply filed on 09/04/2009 is acknowledged.
2. Claim 25 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 09/04/2009.

### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

4. The listing of references in the Search Report is not considered to be an information disclosure statement (IDS) complying with 37 CFR 1.98. 37 CFR 1.98(a)(2) requires a legible copy of: (1) each foreign patent; (2) each publication or that portion which caused it to be listed; (3) for each cited pending U.S. application, the application specification including claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion, unless the cited pending U.S. application is stored in the Image File Wrapper (IFW) system; and (4) all other information, or that portion which caused it to be listed. In addition, each IDS must include a list of all patents, publications,

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applications, or other information submitted for consideration by the Office (see 37 CFR 1.98(a)(1) and (b)), and MPEP § 609.04(a), subsection I. states, "the list ... must be submitted on a separate paper." Therefore, the references cited in the Search Report have not been considered. Applicant is advised that the date of submission of any item of information or any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the IDS, including all "statement" requirements of 37 CFR 1.97(e). See MPEP § 609.05(a).

5. The information disclosure statements filed 04/10/2006, 11/26/2008, and 04/23/2009 fail to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

6. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Press-Fit Power Diode.

8. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 21 recites "the trench has a width which is approximately 0.5 mm in at least one area of the trench" in the last two lines of the claim, which is not disclosed in the specification.

### ***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. **Claims 15-24** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 15 recites the limitation "a plastic sheathing ... is situated at least in an area of the chip" in the 6<sup>th</sup> and 7<sup>th</sup> lines of the claim, which is inconsistently with the specification. Fig. 2 shows that plastic sheathing of 2 and 7 is situated outside an area of the chip 3. This inconsistency renders the claim indefinite.

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12. Claim 15 recites the limitation "a plastic sheathing ... forms a mechanical connection" in the 6<sup>th</sup>-8th lines of the claim. It is unclear which elements the mechanical connection is formed between.

13. Claim 15 recites the limitation "a plastic sheathing which includes a sleeve" in the 6<sup>th</sup> line of the claim, which is inconsistent with the specification. Fig. 2 shows that plastic sheathing 7 does not include the sleeve 2. This inconsistency renders the claim indefinite.

14. Claim 16 recites the limitation "one of the housing and the base" in the second line of the claim. The base 1 is a part of the housing M according to claim 1. This limitation seems redundant and cause confusion.

15. Claim 17 recites the limitation "the height" in the second line of the claim. There is insufficient antecedent basis for this limitation in the claim.

16. Claim 17 recites the limitation "the height of the base is selected to be between 0.5 mm to 0.8 mm" in the second and third lines of the claim, which is inconsistent with the specification. From the disclosure of Fig. 2 and lines 17-28 of page 5 of the specification, the height "a" of the **pedestal 8** is between 0.5 mm to 0.8 mm, while the height of the base is much larger than that of the pedestal 8. This inconsistency renders the claim indefinite.

17. Claim 19 recites the limitation "the plastic sheathing in the area of the chip" in the second line of the claim, which is inconsistent with the specification. Fig. 2 shows that plastic sheathing of 2 and 7 is situated outside an area of the chip 3. This inconsistency renders the claim indefinite.

18. Claim 19 recites the limitation "one sleeve" in the last line of the claim. It is unclear whether this element is different from or the same as "a sleeve" recited in the 6th line of claim 1.

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19. Claim 19 recites the limitation “one area filled with a casting compound” in the last line of the claim. It is unclear whether this element is different from or the same as "a plastic sheathing" recited in the 6th line of claim 1.

20. Claim 20 recites the limitation “a trench” in the second line of the claim. It is unclear whether this element is different from or the same as "a gap" recited in the second last line of claim 1. The specification seems to indicate that they are the same.

21. Claims 18 and 21-24 are rejected because they depend on the rejected claim 1.

### ***Claim Rejections - 35 USC § 102***

22. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

23. **Claims 15 and 16** are rejected under 35 U.S.C. 102(b) as being anticipated by Spitz et al. (US 6,060,776 A) as can be understood since claims 15-24 have been rejected under 35 U.S.C. 112.

24. Regarding **claim 15**, Spitz et al. teach a press-fit diode (rectifier diode 100; Fig. 1, col. 3 lines 15-16), comprising: a head wire (8; Fig. 1, col. 3 lines 21-22); a base (2; Fig. 1, col. 3 line 17); a chip (semiconductor chip 4; Fig. 1, col. 3 lines 19-20) connected via solder layers (solder 5a and 5b; Fig. 1, col. 3 lines 19-21) to the head wire (8) and to the base (2; Fig. 1, col. 3 lines 18-21); and a plastic sheathing (protective sheath 12 and a package 13 of casting resin composition; Fig. 1, col. 3 lines 30-32 and 66-67) which includes a sleeve (protective sheath 12;

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Fig. 1, col. 3 lines 30-32) and is situated at least in an area of the chip (4; the sleeve 12 surrounds the chip 4; see Fig. 1) and forms a mechanical connection (see Fig. 1, the sleeve 12 is connected to the package 13), wherein the base (2) at least partially encloses the plastic sheathing (12 and 13) and forms a housing (i.e. 12, 13 and 2) with the plastic sheathing (12 and 13), and wherein the base (2) includes at least one undercut (shoulder 15; Fig. 1, col. 3 lines 36-37) which extends into the plastic sheathing (12 and 13; see Fig. 1), and wherein a gap (a portion of the trench 10 not occupied by the sheath 12) is provided between the sleeve (12) of the plastic sheathing (12 and 13) and the base (2; see Fig. 1).

25. Regarding **claim 16**, Spitz et al. also teach the press-fit diode as recited in claim 15, wherein one of the housing and the base (the base 2) is made of at least one of an electrically conductive material and thermally conductive material (solid metal which is electrically conductive and thermally conductive; col. 1 lines 8-10 and 32).

### ***Claim Rejections - 35 USC § 103***

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

27. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.



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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

28. **Claims 17-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Spitz et al. as applied to claims 16 above as can be understood since claims 15-24 have been rejected under 35 U.S.C. 112.

29. Regarding **claim 17**, Spitz et al. also teach the height of the base (the height of the bulwark 9; Fig. 1, col. 3 line 50) is selected to achieve an adequate clamping of the base (2) and the head wire (8; i.e. the whole construction including 2 and 8, col. 3 lines 40-60).

Spitz et al. do not teach the height of the base is selected to be between 0.5 mm to 0.8 mm.

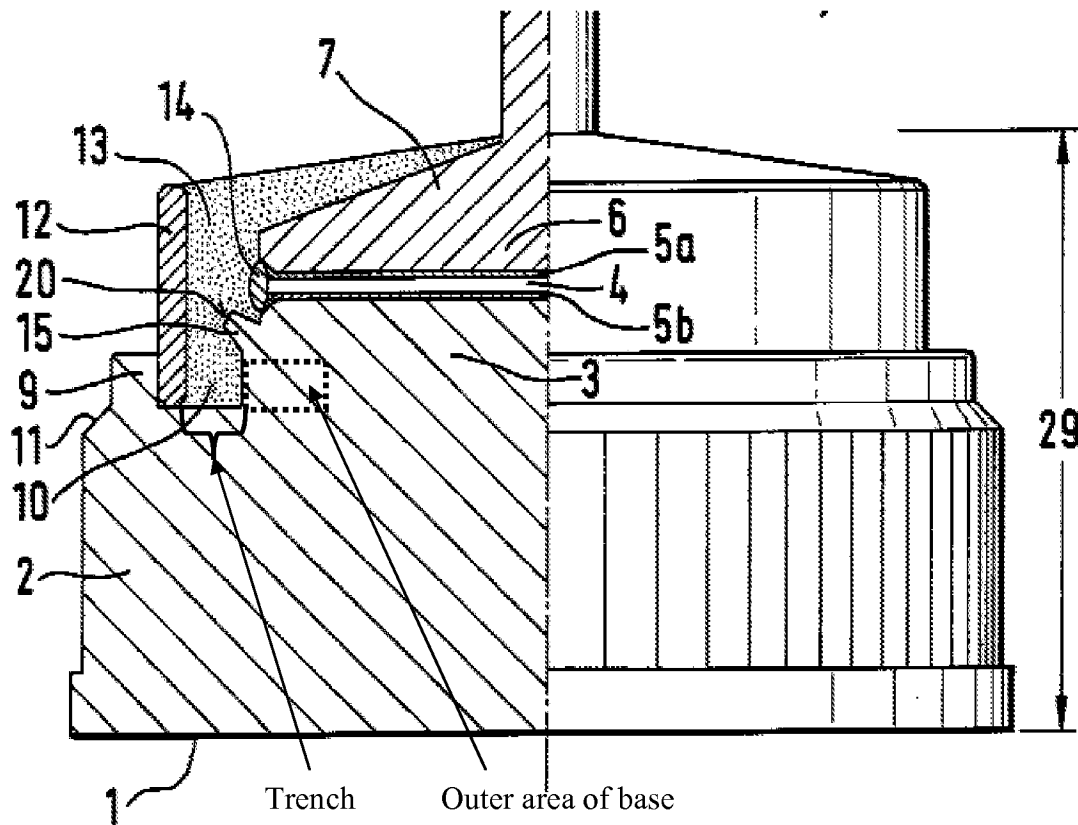
Parameters such as the height of the base in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired structural strength during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the height of the base within the range as claimed in order to achieve the desired structural strength.

30. Regarding **claim 18**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the housing (12, 13 and 2) has one of bevels and lead-in chamfers (press-fit region 11; Fig. 1, col. 3 lines 25-26) which enable the diode (100) to be pressed into a rectifier (col. 1 lines 6-8 and col. 3 lines 24-27).

31. Regarding **claim 19**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the plastic sheathing (12 and 13) in the area of the chip (surrounding chip 4) includes at least one sleeve (protective sheath 12; Fig. 1, col. 3 lines 30-32) and one area (package 13; Fig.

1, col. 3 lines 30-32) filled with a casting compound (casting resin composition; col. 3 lines 66-67).

32. Regarding **claim 20**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein a trench (a portion of the trench 10 not occupied by the sheath 12) having a predetermined depth (see Fig. 1) is provided between the sleeve (12) and an outer area of the base (a portion of base 2 in contact with the right hand side of the trench 10; see the figure below).



A portion of Fig. 1 of Spitz et al. showing the trench and the outer area of base

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33. Regarding **claim 21**, Spitz et al. also teach the trench (a portion of the trench 10 not occupied by the sheath 12) has a width (the horizontal width).

Spitz et al. do not teach the trench has a width which is approximately 0.5 mm in at least one area of the trench.

Parameters such as the width of the trench in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired structural strength during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the width of the trench within the range as claimed in order to achieve the desired structural strength.

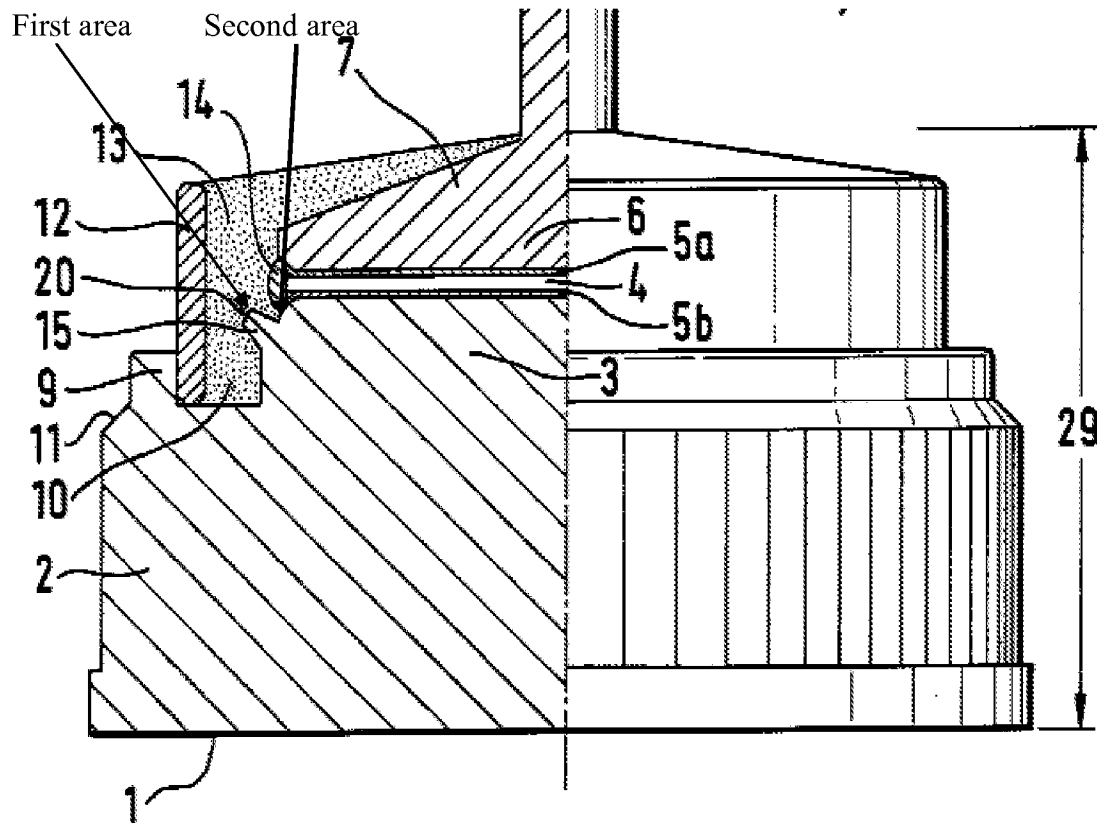
34. Regarding **claim 22**, Spitz et al. also teach the press-fit diode as recited in claim 21, wherein the width (the horizontal width) of the trench (a portion of the trench 10 not occupied by the sheath 12 from the bottom of bulwark 9 till the top of the bulwark 9) is essentially uniform over the entire depth of the trench (see Fig. 1).

35. Regarding **claim 23**, Spitz et al. also teach the press-fit diode as recited in claim 21, wherein the width (the horizontal width) of the trench (a portion of the trench 10 not occupied by the sheath 12 from the bottom of bulwark 9 till the top of the shoulder 15) is variable over the depth of the trench (see Fig. 1, the horizontal width of the trench varies at the shoulder 15).

36. Regarding **claim 24**, Spitz et al. also teach the press-fit diode as recited in claim 17, wherein the base (2) includes an outer region (shoulder 15; Fig. 1, col. 3 line 37) having a first area (top area) with a first inner diameter (the diameter corresponds to the inner side of the shoulder 15 at the top) and a second area (lower area) with a second inner diameter (the diameter

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corresponds to the inner side of the shoulder 15 at a lower position) smaller than the first inner diameter (see the figure below).



A portion of Fig. 1 of Spitz et al. showing the first area and the second area

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsin-Yi (Steven) Hsieh whose telephone number is 571-270-3043. The examiner can normally be reached on Monday to Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/  
Supervisory Patent Examiner, Art Unit  
2811

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Examiner, Art Unit 2811  
11/6/2009